

ARE TWO-WIRE CONTROL SYSTEMS IN YOUR FUTURE?

By Ed Underhill, Underhill International Corp, for LSMP

Irrigation industry analysts predict that within the next five years, two-wire control systems will be the industry standard for most mid- to large-sized residential and commercial installations in the U.S.

Rapid changes are already taking place and contractors, particularly on the East Coast and Midwest, are converting to two-wire installations for practical reasons:

- Proven track records on thousands of installations around the world
- Uses less copper wire in every installation, reducing major expense
- Significant cost-savings in material and labor
- Fast learning curve to understanding
- Simplicity of installing a two-wire system
- Opportunity to be more competitive in bids
- Long-term reliability.

Two-wire is not a new technology. Attempts to simplify wire runs were made in the 1960s and 70s, primarily for golf courses. However, those early installations used DC current and had a range of problems. In the last 10 years important technical improvements have been made to ensure reliability and to simplify installation and operation.

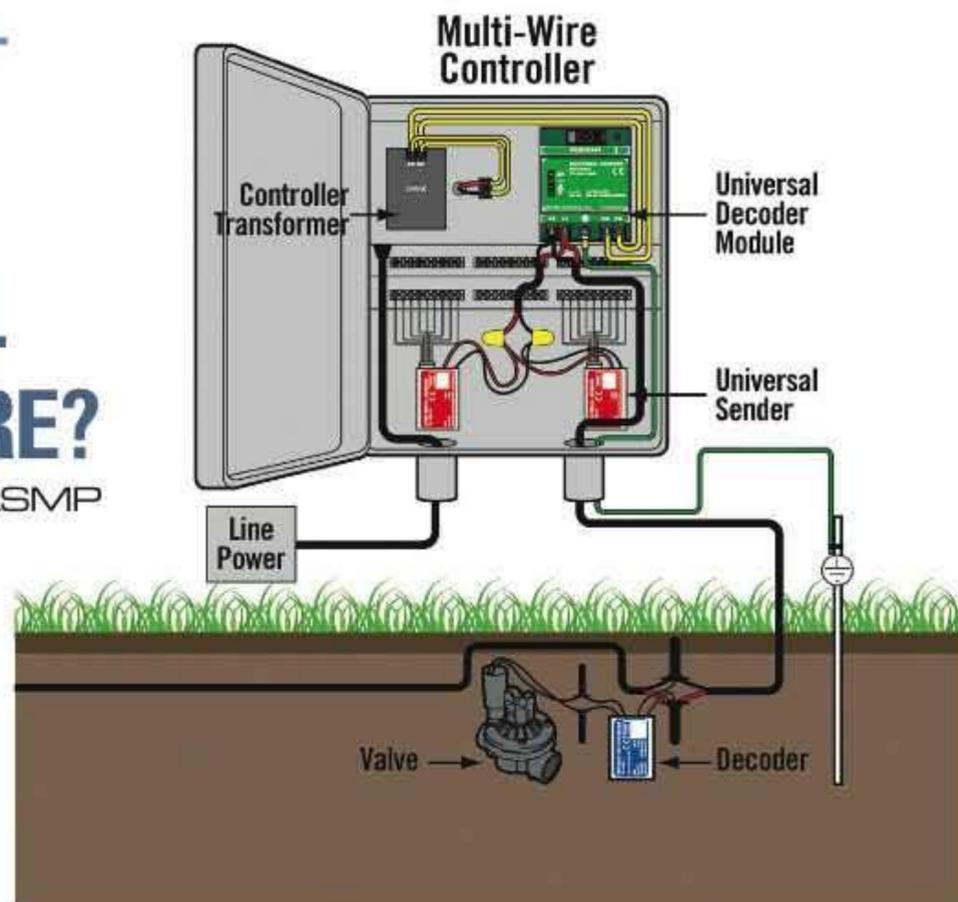
100,000-plus Installations

Two-wire systems have now been developed using AC current and advanced decoder/receiver technology. Two-wire irrigation has become the standard throughout Europe and in many areas of the developed world. In fact, decoder/receivers using Underhill 2-Wire technology have been utilized in more than 100,000 valve installations.

Switching to two-wire doesn't mean that you have to change your favorite brand of controller. Any commercial controller can easily be converted to two-wire operation. This flexibility means you and your crew can snap a decoder module into a Hunter ICC Controller – or use a universal decoder module to convert any controller of your choice. You can stay with the same controller programming that you already know and don't need to spend time retraining on a new system.

Benefits of Two-wire Technology

Two-wire controllers use just a single pair of wires that extend from the controller to each valve in the irrigation network. Instead of a maze of wires running to each



Universal Internal Mount with Multi-Wire Controller

Universal decoder modules convert any commercial controller to two-wire operation. With an internal mount, the decoder modules neatly install inside your favorite controller and can be connected to the controller transformer (24v to 32v) and two-wire branch. You then set the valve station addresses of the universal senders and connect them to the controller terminal strips and the universal decoder module. IMAGES COURTESY OF UNDERHILL, WWW.UNDERHILL.US

station, there are just two wires going through the entire system, starting from the controller and running out to the last valve in the network. The two-wire path can be branched in any direction that works best on the site.

The time, effort, wire and other materials needed to install two-wire is considerably less than a conventional system. Just laying out the two-wire is a fairly simple process.

For example, with two-wire you set up the most direct path to the valves. Originating at the controller, you take the two wires – the common wire and the hot wire – and hook up the valve and decoder/receiver at Station No. 1. Then you extend the same two wires from Station No. 1 to Station No. 2 and continue to the remaining valves on the site.

Unique Address for Each Valve

Each valve decoder/receiver has its own unique address corresponding to the station number. During installation each valve decoder/receiver is programmed in the field with that specific address.

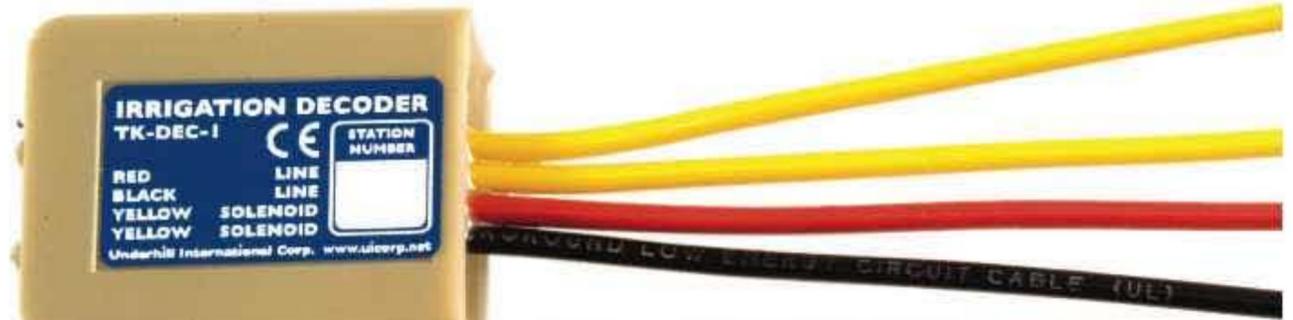
As the controller runs through the program, it sends out a signal, looking for a specific valve's address. If the first valve's decoder/receiver has that address number, it closes the decoder's electronic switch and allows the 24-volt current to pass through and activate the solenoid. The station runs its programmed time, then turns off. The controller continues through the program, sending out another signal looking for the next valve's address.

This relay of information from the controller to the decoder/receivers is what makes two-wire technology different from conventional multi-wire systems.



PHOTO: RAIN BIRD

Rain Bird Corporation's decoder.



Underhill 2-wire decoder actually has four wires. The two yellow wires connect to the valve solenoid, which activates the station.

Installing two-wire does not require any special equipment or tools. You can use the same valves that you are familiar with and the same solenoids and waterproof connectors that are on your truck. Even the wire is typical irrigation wire.

The only new components are the ICC decoder module (for the Hunter ICC) or a universal decoder module for all other controllers, along with the universal senders and decoder/receivers at each station.

Converting Existing Controllers

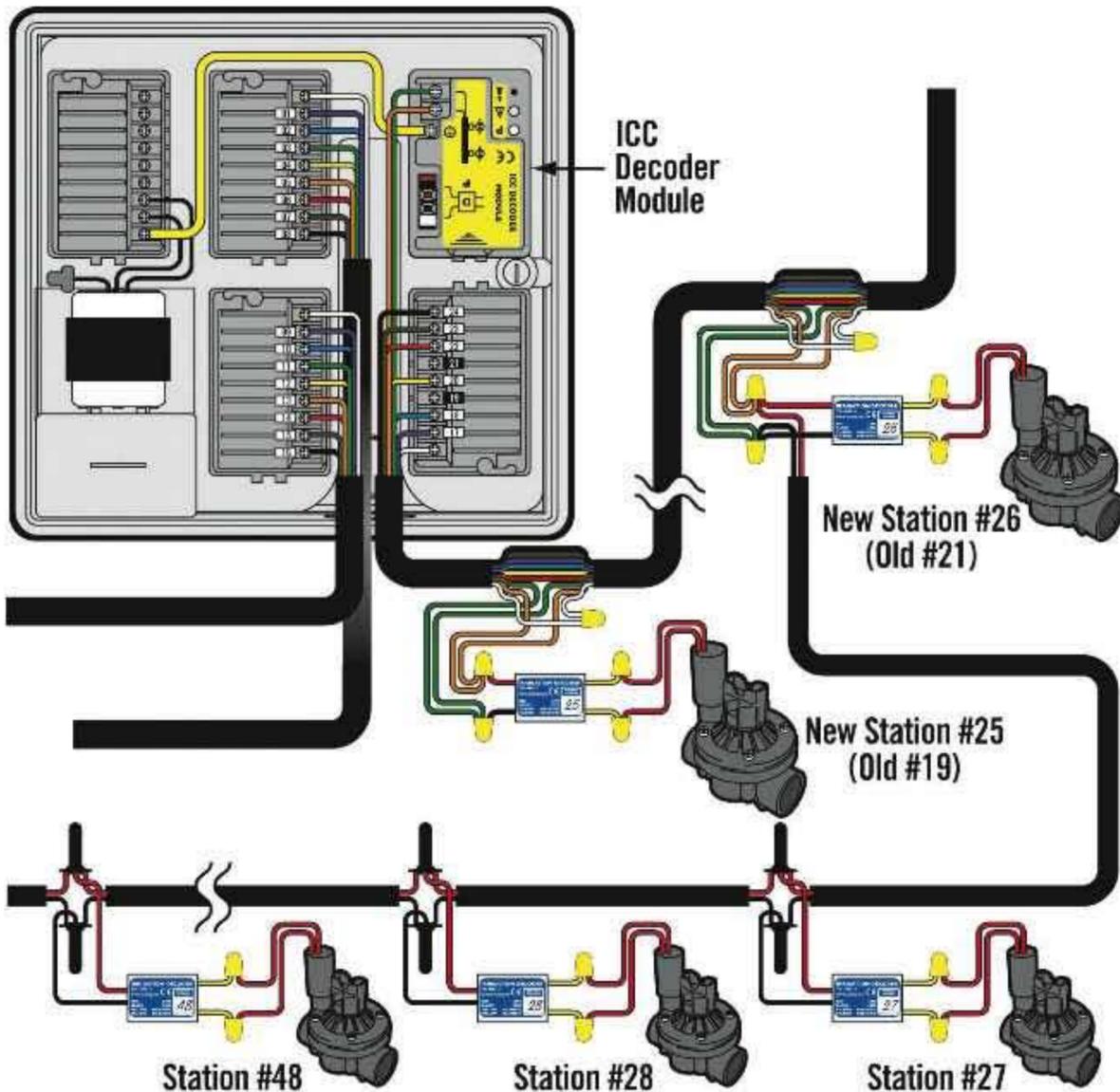
Any existing commercial controller can easily be entirely (or partly) expanded or converted to two-wire. Let's say you have installed a system on a mid-sized sports field operating 16 stations. If you plan to expand the system, you can either do it conventionally or convert the controller to two-wire.

In a conventional installation, you would dig trenches to accommodate the wiring from the controller to the new valves, then extend the common and run a hot wire from each new valve back to the controller. There would be significant costs with labor, wire, valves and additional materials.

By expanding with two-wire, you could either install a two-wire path from the controller or select and disconnect hot wires from any two valves and use these two wires to create a two-wire path to the controller without digging any new trenches or running more wire. This is particularly useful when the expanded area is across a parking lot or busy street.

If you are expanding a system that was originally converted to two-wire, it's even easier. You simply splice additional valve stations with decoders/ receivers anywhere along the two-wire path. No new wires need to be added to run back to the controller. The new valves will operate along the two-wire path without being directly connected back to the timer.

A longer version of this article is available at LandscapeOnline.com.



Ed Underhill has worked in the landscape irrigation industry for more than 20 years and is president of Underhill International Corp. in Lake Forest, Calif. The company manufactures two-wire control systems, large turf rotors, FCI Profile nozzles and a range of water-saving equipment for sports fields, golf courses and commercial installations. Additional information about two-wire products and installations is available at www.underhill.us.

Underhill's universal decoder module works with most commercial controllers, including Rain Bird and Toro.



Hunter ICC Controller with Decoder Module

Decoder modules are available for Hunter ICC controllers, which can be converted to full or partial two-wire operation up to 48 stations. The ICC decoder module simply snaps into the control panel. Disconnect two existing valves (in the field and at the controller terminal strip) and use the two control hot wires as a new two-wire path. Set station addresses in the decoder/receivers and connect them to the two-wire path.